

# RADIOLOGYINFO™

The radiology information resource for patients

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## Mission Statement

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*RadiologyInfo™* is the public information Web site developed and funded by the American College of Radiology (ACR) and the Radiological Society of North America (RSNA). It was established to inform and educate the public about radiologic procedures and the role of radiologists in healthcare, and to improve communications between physicians and their patients.

Each section of the site has been created with the guidance of a physician with expertise in the topic presented. All information contained in the Web site is further reviewed by an ACR-RSNA committee, comprising physicians with expertise in several radiologic areas.

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This Web site will be updated frequently and expanded to include new information.

If you have questions (no medical advice or referrals) please see the Frequently Asked Questions (FAQ) page. If you wish to submit comments please use the form on the Comments page or the comments area provided near the bottom of each procedure page. Comments may also be sent via e-mail to the *RadiologyInfo* Webmaster.



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## Radiation Therapy and You: Support for People With Cancer



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## Radiation Therapy Side Effects and Ways to Manage Them

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## Diarrhea

## What It Is

Diarrhea is frequent bowel movements which may be soft, formed, loose, or watery. Diarrhea can occur at any time during radiation therapy.

## Why it occurs

Radiation therapy to the pelvis, stomach, and abdomen can cause diarrhea. People get diarrhea because radiation harms the healthy cells in the large and small bowels. These areas are very sensitive to the amount of radiation needed to treat cancer.

## Ways to manage

When you have diarrhea:

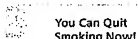
- **Drink 8 to 12 cups of clear liquid per day.** See "[Clear Liquids](#)" for ideas of drinks and foods that are clear liquids.

If you drink liquids that are high in sugar (such as fruit juice, sweet iced tea, Kool-Aid®, or Hi-C®) ask your nurse or dietitian if you should mix them with water.

- **Eat many small meals and snacks.** For instance, eat 5 or 6 small meals and snacks rather than 3 large meals.
- **Eat foods that are easy on the stomach** (which means foods that are low in fiber, fat, and lactose). See "[Foods and Drinks That Are Easy on the Stomach](#)" for other ideas of foods that are easy on the stomach. If your diarrhea is severe, your doctor or nurse may suggest the BRAT diet, which stands for bananas, rice, applesauce, and toast.



Radiation to the shaded area may cause diarrhea.

**NCI Highlights**[Report Finds Cancer Death](#)[Rate Decline Doubling](#)[The Nation's Investment in](#)[Cancer Research FY 2008](#)[Statement on Fiscal Year](#)[2008 Budget Request](#)[President's Cancer Panel](#)[Annual Report: 2006-2007](#)[Cancer Trends Progress](#)[Report: 2005 Update](#)[NCAB Working Group Report](#)[on Biomedical Technology](#)[Past Highlights](#)[HPV Vaccines for Cervical Cancer](#)[Learn More](#)

- Take care of your rectal area. Instead of toilet paper, use a baby wipe or squirt of water from a spray bottle to clean yourself after bowel movements. Also, ask your nurse about taking **sitz baths**, which is a warm-water bath taken in a sitting position that covers only the hips and buttocks. Be sure to tell your doctor or nurse if your rectal area gets sore.
- Stay away from:
  - Milk and dairy foods, such as ice cream, sour cream, and cheese
  - Spicy foods, such as hot sauce, salsa, chili, and curry dishes
  - Foods or drinks with caffeine, such as regular coffee, black tea, soda, and chocolate
  - Foods or drinks that cause gas, such as cooked dried beans, cabbage, broccoli, soy milk, and other soy products
  - Foods that are high in fiber, such as raw fruits and vegetables, cooked dried beans, and whole wheat breads and cereals
  - Fried or greasy foods
  - Food from fast food restaurants
- Talk to your doctor or nurse. Tell them if you are having diarrhea. He or she will suggest ways to manage it. He or she may also suggest taking medicine, such as Imodium®.



To learn more about dealing with diarrhea during cancer treatment, see [Eating Hints](#), a book from the National Cancer Institute. You can get a free copy at [www.cancer.gov/publications](http://www.cancer.gov/publications) or 1-800-4-CANCER.

**Fatigue**

Fatigue is a common side effect, and there's a good chance that you will feel some level of fatigue from radiation therapy.

**What it is**

Fatigue from radiation therapy can range from a mild to an extreme feeling of being tired. Many people describe fatigue as feeling weak, weary, worn out, heavy, or slow.

**Why it occurs**

Fatigue can happen for many reasons. These include:

- Anemia
- Anxiety
- Depression
- Infection
- Lack of activity
- Medicines



Fatigue can also come from the effort of going to radiation therapy each day or from stress. Most of the time, you will not know why you feel fatigue.

**How long it lasts**

When you first feel fatigue depends on a few factors, which include your age, health, level of activity, and how you felt before radiation therapy started.

Fatigue can last from 6 weeks to 12 months after your last radiation therapy session. Some people may always feel fatigue and, even after radiation therapy is over, will not have as much energy as they did before.

#### Ways to manage

- **Try to sleep at least 8 hours each night.** This may be more sleep than you needed before radiation therapy. One way to sleep better at night is to be active during the day. For example, you could go for walks, do yoga, or ride a bike. Another way to sleep better at night is to relax before going to bed. You might read a book, work on a jigsaw puzzle, listen to music, or do other calming hobbies.
- **Plan time to rest.** You may need to nap during the day. Many people say that it helps to rest for just 10 to 15 minutes. If you do nap, try to sleep for less than 1 hour at a time.
- **Try not to do too much.** With fatigue, you may not have enough energy to do all the things you want to do. Stay active, but choose the activities that are most important to you. For example, you might go to work but not do housework, or watch your children's sports events but not go out to dinner.
- **Exercise.** Most people feel better when they get some exercise each day. Go for a 15- to 30-minute walk or do stretches or yoga. Talk with your doctor or nurse about how much exercise you can do while having radiation therapy.
- **Plan a work schedule that is right for you.** Fatigue may affect the amount of energy you have for your job. You may feel well enough to work your full schedule, or you may need to work less - maybe just a few hours a day or a few days each week. You may want to talk with your boss about ways to work from home so you do not have to commute. And you may want to think about going on medical leave while you have radiation therapy.
- **Plan a radiation therapy schedule that makes sense for you.** You may want to schedule your radiation therapy around your work or family schedule. For example, you might want to have radiation therapy in the morning so you can go to work in the afternoon.
- **Let others help you at home.** Check with your insurance company to see whether it covers home care services. You can also ask family members and friends to help when you feel fatigue. Home care staff, family members, and friends can assist with household chores, running errands, or driving you to and from radiation therapy visits. They might also help by cooking meals for you to eat now or freeze for later.
- **Learn from others who have cancer.** People who have cancer can help each other by sharing ways to manage fatigue. One way to meet other people with cancer is by joining a support group - either in person or online. Talk with your doctor or nurse to learn more about support groups.
- **Talk with your doctor or nurse.** If you have trouble dealing with fatigue, your doctor may prescribe medicine (called psychostimulants) that can help decrease fatigue, give you a sense of well-being, and increase your appetite. Your doctor may also suggest treatments if you have anemia, depression, or are not able to sleep at night.



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## Hair Loss

### What it is

Hair loss (also called alopecia) is when some or all of your hair falls out.

### Why it occurs

Radiation therapy can cause hair loss because it damages cells that grow quickly, such as those in your hair roots.

Hair loss from radiation therapy only happens on the part of your body being treated. This is not the same as hair loss from chemotherapy, which happens all over your body. For instance, you may lose some or all of the hair on your head when you get radiation to your brain. But if you get radiation to your hip, you may lose pubic hair (between your legs) but not the hair on your head.

#### How long it lasts

You may start losing hair in your treatment area 2 to 3 weeks after your first radiation therapy session. It takes about a week for all the hair in your treatment area to fall out. Your hair may grow back 3 to 6 months after treatment is over. Sometimes, though, the dose of radiation is so high that your hair never grows back.

Once your hair starts to grow back, it may not look or feel the way it did before. Your hair may be thinner, or curly instead of straight. Or it may be darker or lighter in color than it was before.

#### Ways to manage hair loss on your head

##### Before hair loss:

- Decide whether to cut your hair or shave your head. You may feel more in control of hair loss when you plan ahead. Use an electric razor to prevent nicking yourself if you decide to shave your head.
- If you plan to buy a wig, do so while you still have hair. The best time to select your wig is before radiation therapy begins or soon after it starts. This way, the wig will match the color and style of your own hair. Some people take their wig to their hair stylist. You will want to have your wig fitted once you have lost your hair. Make sure to choose a wig that feels comfortable and does not hurt your scalp.
- Check with your health insurance company to see whether it will pay for your wig. If it does not, you can deduct the cost of your wig as a medical expense on your income taxes. Some groups also sponsor free wig banks. Ask your doctor, nurse, or social worker if he or she can refer you to a free wig bank in your area.
- Be gentle when you wash your hair. Use a mild shampoo, such as a baby shampoo. Dry your hair by patting (not rubbing) it with a soft towel.
- Do not use curling irons, electric hair dryers, curlers, hair bands, clips, or hair sprays. These can hurt your scalp or cause early hair loss.
- Do not use products that are harsh on your hair. These include hair colors, perms, gels, mousse, oil, grease, or pomade.



##### After hair loss:

- Protect your scalp. Your scalp may feel tender after hair loss. Cover your head with a hat, turban, or scarf when you are outside. Try not to be in places where the temperature is very cold or very hot. This means staying away from the direct sun, sun lamps, and very cold air.
- Stay warm. Your hair helps keep you warm, so you may feel colder once you lose it. You can stay warmer by wearing a hat, turban, scarf, or wig.



You will lose hair only on the part of your body being treated.

#### Mouth Changes

##### What they are

Radiation therapy to the head or neck can cause problems such as:

- Mouth sores (little cuts or ulcers in your mouth)
- Dry mouth (also called xerostomia) and throat
- Loss of taste
- Tooth decay
- Changes in taste (such as a metallic taste when you eat meat)
- Infections of your gums, teeth, or tongue
- Jaw stiffness and bone changes
- Thick, rope-like saliva

#### Why they occur

Radiation therapy kills cancer cells and can also damage healthy cells such as those in the glands that make saliva and the soft, moist lining of your mouth.

#### How long they last

Some problems, like mouth sores, may go away after treatment ends. Others, such as taste changes, may last for months or even years. Some problems, like dry mouth, may never go away.



*Radiation to the shaded area may cause mouth changes.*



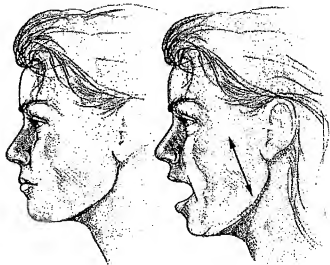
**Visit a dentist at least 2 weeks before starting radiation therapy to your head or neck.**

#### Ways to manage

- If you are getting radiation therapy to your head or neck, visit a dentist at least 2 weeks before treatment starts. At this time, your dentist will examine your teeth and mouth and do any needed dental work to make sure your mouth is as healthy as possible before radiation therapy. If you cannot get to the dentist before treatment starts, ask your doctor if you should schedule a visit soon after treatment begins.
- Check your mouth every day. This way, you can see or feel problems as soon as they start. Problems can include mouth sores, white patches, or infection.
- Keep your mouth moist. You can do this by:
  - Sipping water often during the day
  - Sucking on ice chips
  - Chewing sugar-free gum or sucking on sugar-free hard candy
  - Using a saliva substitute to help moisten your mouth
  - Asking your doctor to prescribe medicine that helps increase saliva
- Clean your mouth, teeth, gums, and tongue.
  - Brush your teeth, gums, and tongue after every meal and at bedtime.
  - Use an extra-soft toothbrush. You can make the bristles softer by running warm water over them just before you brush.
  - Use a fluoride toothpaste.
  - Use a special fluoride gel that your dentist can prescribe.
  - Do not use mouthwashes that contain alcohol.
  - Gently floss your teeth every day. If your gums bleed or hurt, avoid those areas but floss your other teeth.
  - Rinse your mouth every 1 to 2 hours with a solution of 1/4 teaspoon baking soda and 1/8 teaspoon salt mixed in 1 cup of warm water.
  - If you have dentures, make sure they fit well and limit how long you wear them each day. If you lose weight, your dentist may need to adjust them.
  - Keep your dentures clean by soaking or brushing them each day.



- Be careful what you eat when your mouth is sore.
  - Choose foods that are easy to chew and swallow.
  - Take small bites, chew slowly, and sip liquids with your meals.
  - Eat moist, soft foods such as cooked cereals, mashed potatoes, and scrambled eggs.
  - Wet and soften food with gravy, sauce, broth, yogurt, or other liquids.
  - Eat foods that are warm or at room temperature.
- Stay away from things that can hurt, scrape, or burn your mouth, such as:
  - Sharp, crunchy foods such as potato or corn chips
  - Hot foods
  - Spicy foods such as hot sauce, curry dishes, salsa, and chili
  - Fruits and juices that are high in acid such as tomatoes, oranges, lemons, and grapefruits
  - Toothpicks or other sharp objects
  - All tobacco products, including cigarettes, pipes, cigars, and chewing tobacco
  - Drinks that contain alcohol
- Stay away from foods and drinks that are high in sugar. Foods and drinks that have a lot sugar (such as regular soda, gum, and candy) can cause tooth decay.
- Exercise your jaw muscles. Open and close your mouth 20 times as far as you can without causing pain. Do this exercise 3 times a day, even if your jaw isn't stiff.
- Medicine. Ask your doctor or nurse about medicines that can protect your saliva glands and the moist tissues that line your mouth.
- Call your doctor or nurse when your mouth hurts. There are medicines and other products, such as mouth gels, that can help control mouth pain.
- You will need to take extra good care of your mouth for the rest of your life. Ask your dentist how often you will need dental check-ups and how best to take care of your teeth and mouth after radiation therapy is over.



Do not use tobacco or drink alcohol while you are getting radiation therapy to your head or neck.

## Nausea and Vomiting

### What they are

Radiation therapy can cause nausea, vomiting, or both. Nausea is when you feel sick to your stomach and feel like you are going to throw up. Vomiting is when you throw up food and fluids. You may also have dry heaves, which happen when your body tries to vomit even though your stomach is empty.

### Why they occur

Nausea and vomiting can occur after radiation therapy to the stomach, small intestine, colon, or parts of the brain. Your risk for nausea and vomiting depends on how much radiation you are getting, how much of your body is in the treatment area, and whether you are also having chemotherapy.

### How long they last

Nausea and vomiting may occur 30 minutes to many hours after your radiation therapy session ends. You are likely to feel better on days that you do not have radiation therapy.

### Ways to manage

- **Prevent nausea.** The best way to keep from vomiting is to prevent nausea. One way to do this is by having bland, easy-to-digest foods and drinks that do not upset your stomach. These include toast, gelatin, and apple juice. To learn more, see the list of [Foods and Drinks That Are Easy on the Stomach](#).
- **Try to relax before treatment.** You may feel less nausea if you relax before each radiation therapy treatment. You can do this by spending time doing activities you enjoy, such as reading a book, listening to music, or other hobbies.
- **Plan when to eat and drink.** Some people feel better when they eat before radiation therapy; others do not. Learn the best time for you to eat and drink. For example, you might want a snack of crackers and apple juice 1 to 2 hours before radiation therapy. Or, you might feel better if you have treatment on an empty stomach, which means not eating 2 to 3 hours before treatment.
- **Eat small meals and snacks.** Instead of eating 3 large meals each day, you may want to eat 5 or 6 small meals and snacks. Make sure to eat slowly and do not rush.
- **Have foods and drinks that are warm or cool (not hot or cold).** Before eating or drinking, let hot food and drinks cool down and cold food and drinks warm up.
- **Talk with your doctor or nurse.** He or she may suggest a special diet of foods to eat or prescribe medicine to help prevent nausea, which you can take 1 hour before each radiation therapy session. You might also ask your doctor or nurse about [acupuncture](#), which may help relieve nausea and vomiting caused by cancer treatment.



Radiation to the shaded area may cause nausea and vomiting.



Eat 5 or 6 small meals and snacks each day instead of 3 large meals.

Learn more from [Eating Hints](#), a book from the National Cancer Institute. To get a free copy, contact the Cancer Information Service.

## Sexual and Fertility Changes

### What they are

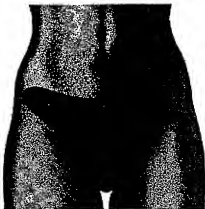
Radiation therapy sometimes causes sexual changes, which can include hormone changes and loss of interest in or ability to have sex. It can also affect fertility during and after radiation therapy. For a woman, this means that she might not be able to get pregnant and have a baby. For a man, this means that he

might not be able to get a woman pregnant. Sexual and fertility changes differ for men and women.

Be sure to tell your doctor if you are pregnant before you start radiation therapy.

#### Problems for women include:

- Pain or discomfort when having sex
- Vaginal itching, burning, dryness, or atrophy (when the muscles in the vagina become weak and the walls of the vagina become thin)
- Vaginal stenosis, when the vagina becomes less elastic, narrows, and gets shorter
- Symptoms of menopause for women not yet in menopause. These include hot flashes, vaginal dryness, and not having your period.
- Not being able to get pregnant after radiation therapy is over



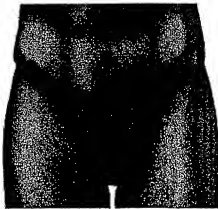
Radiation to the shaded area may cause sexual and fertility changes.

#### Problems for men include:

- Impotence (also called erectile dysfunction or ED), which means not being able to have or keep an erection
- Not being able to get a woman pregnant after radiation therapy is over due to fewer or less effective sperm

#### Why they occur

Sexual and fertility changes can happen when people get radiation therapy to the pelvic area. For women, this includes radiation to the vagina, uterus, or ovaries. For men, this includes radiation to the testicles or prostate. Many sexual side effects are caused by scar tissue from radiation therapy. Other problems, such as fatigue, pain, anxiety, or depression, can affect your interest in having sex.



#### How long they last

After radiation therapy is over, most people want to have sex as much as they did before treatment. Many sexual side effects go away after treatment ends. But you may have problems with hormone changes and fertility for the rest of your life. If you are able to get pregnant or father a child after you have finished radiation therapy, it should not affect the health of the baby.

#### Ways to manage

For both men and women, it is important to be open and honest with your spouse or partner about your feelings, concerns, and how you prefer to be intimate while you are getting radiation therapy.



For women, here are some issues to discuss with your doctor or nurse:

- **Fertility.** Before radiation therapy starts, let your doctor or nurse know if you think you might want to get pregnant after your treatment ends. He or she can talk with you about ways to preserve your fertility, such as preserving your eggs to use in the future.
- **Sexual problems.** You may or may not have sexual problems. Your doctor or nurse can tell you about side effects you can expect and suggest ways for coping with them.
- **Birth control.** It is very important that you do not get pregnant while having radiation therapy. Radiation therapy can hurt the fetus at all stages of pregnancy. If you have not yet gone through

menopause, talk with your doctor or nurse about birth control and ways to keep from getting pregnant.

- **Pregnancy.** Make sure to tell your doctor or nurse if you are already pregnant.
- **Stretching your vagina.** Vaginal stenosis is a common problem for women who have radiation therapy to the pelvis. This can make it painful to have sex. You can help by stretching your vagina using a dilator (a device that gently stretches the tissues of the vagina). Ask your doctor or nurse where to find a dilator and how to use it.
- **Lubrication.** Use a special lotion for your vagina (such as Replens®) once a day to keep it moist. When you have sex, use a water- or mineral oil-based lubricant (such as K-Y Jelly® or Astroglide®).
- **Sex.** Ask your doctor or nurse whether it is okay for you to have sex during radiation therapy. Most women can have sex, but it is a good idea to ask and be sure. If sex is painful due to vaginal dryness, you can use a water- or mineral oil-based lubricant.



Talk to your doctor or nurse if you want to have children in the future.

For men, here are some issues to discuss with your doctor or nurse:

- **Fertility.** Before you start radiation therapy, let your doctor or nurse know if you think you might want to father children in the future. He or she may talk with you about ways to preserve your fertility before treatment starts, such as banking your sperm. Your sperm will need to be collected before you begin radiation therapy.
- **Impotence.** Your doctor or nurse can let you know whether you are likely to become impotent and how long it might last. Your doctor can prescribe medicine or other treatments that may help.
- **Sex.** Ask if it is okay for you to have sex during radiation therapy. Most men can have sex, but it is a good idea to ask and be sure.



If you want to father children in the future, your sperm will need to be collected before you begin treatment.

## Skin Changes

What they are

Radiation therapy can cause skin changes in your treatment area. Here are some common skin changes:

- **Redness.** Your skin in the treatment area may look as if you have a mild to severe sunburn or tan. This can occur on any part of your body where you are getting radiation.
- **Pruritus.** The skin in your treatment area may itch so much that you always feel like scratching. This causes problems because scratching too much can lead to skin breakdown and infection.
- **Dry and peeling skin.** This is when the skin in your treatment area gets very dry - much drier than normal. In fact, your skin may be so dry that it peels like it does after a sunburn.
- **Moist reaction.** Radiation kills skin cells in your treatment area, causing your skin to peel off faster than it can grow back. When this happens, you can get sores or ulcers. The skin in your treatment area can also become wet, sore, or infected. This is more common where you have skin folds, such as your buttocks, behind your ears, under your breasts. It may also occur where your skin is very thin, such as your neck.

- **Swollen skin.** The skin in your treatment area may be swollen and puffy.

#### Why they occur

Radiation therapy causes skin cells to break down and die. When people get radiation almost every day, their skin cells do not have enough time to grow back between treatments. Skin changes can happen on any part of the body that gets radiation.

#### How long they last

Skin changes may start a few weeks after you begin radiation therapy. Many of these changes often go away a few weeks after treatment is over. But even after radiation therapy ends, you may still have skin changes. Your treated skin may always look darker and blotchy. It may feel very dry or thicker than before. And you may always burn quickly and be sensitive to the sun. You will always be at risk for skin cancer in the treatment area. Be sure to avoid tanning beds and protect yourself from the sun by wearing a hat, long sleeves, long pants, and sunscreen with an SPF of 30 or higher.



#### Ways to manage

- **Skin care.** Take extra good care of your skin during radiation therapy. Be gentle and do not rub, scrub, or scratch in the treatment area. Also, use creams that your doctor prescribes.

Take extra good care of your skin during radiation therapy. Be gentle and do not rub, scrub, or scratch.

- **Do not put anything on your skin that is very hot or cold.** This means not using heating pads, ice packs, or other hot or cold items on the treatment area. It also means washing with lukewarm water.
- **Be gentle when you shower or take a bath.** You can take a lukewarm shower every day. If you prefer to take a lukewarm bath, do so only every other day and soak for less than 30 minutes. Whether you take a shower or bath, make sure to use a mild soap that does not have fragrance or deodorant in it. Dry yourself with a soft towel by patting, not rubbing, your skin. Be careful not to wash off the ink markings that you need for radiation therapy.

Be careful not to wash off the ink markings you need for radiation therapy.

- **Use only those lotions and skin products that your doctor or nurse suggests.** If you are using a prescribed cream for a skin problem or acne, you must tell your doctor or nurse before you begin radiation treatment. Check with your doctor or nurse before using any of the following skin products:

- |                 |             |
|-----------------|-------------|
| • Bubble bath   | • Oil       |
| • Cornstarch    | • Ointment  |
| • Cream         | • Perfume   |
| • Deodorant     | • Powder    |
| • Hair removers | • Soap      |
| • Makeup        | • Sunscreen |

If you use any skin products on days you have radiation therapy, use them at least 4 hours before your treatment session.

- **Cool, humid places.** Your skin may feel much better when you are in cool, humid places. You can make rooms more humid by putting a bowl of water on the radiator or using a humidifier. If you use a humidifier, be sure to follow the directions about cleaning it to prevent bacteria.
- **Soft fabrics.** Wear clothes and use bed sheets that are soft, such as those made from cotton.
- **Do not wear clothes that are tight and do not breathe, such as girdles and pantyhose.**
- **Protect your skin from the sun every day.** The sun can burn you even on cloudy days or when you are outside for just a few minutes. Do not go to the beach or sun bathe. Wear a broad-brimmed hat, long-sleeved shirt, and long pants when you are outside. Talk with your doctor or nurse about sunscreen lotions. He or she may suggest that you use a sunscreen with an SPF of 30 or higher. You will need to protect your skin from the



sun even after radiation therapy is over, since you will have an increased risk of skin cancer for the rest of your life.

- **Do not use tanning beds.** Tanning beds expose you to the same harmful effects as the sun.
- **Adhesive tape.** Do not put bandages, BAND-AIDS®, or other types of sticky tape on your skin in the treatment area. Talk with your doctor or nurse about ways to bandage without tape.
- **Shaving.** Ask your doctor or nurse if you can shave the treated area. If you can shave, use an electric razor and do not use pre-shave lotion.
- **Rectal area.** If you have radiation therapy to the rectal area, you are likely to have skin problems. These problems are often worse after a bowel movement. Clean yourself with a baby wipe or squirt of water from a spray bottle. Also ask your nurse about sitz baths (a warm-water bath taken in a sitting position that covers only the hips and buttocks.)
- **Talk with your doctor or nurse.** Some skin changes can be very serious. Your treatment team will check for skin changes each time you have radiation therapy. Make sure to report any skin changes that you notice.
- **Medicine.** Medicines can help with some skin changes. They include lotions for dry or itchy skin, antibiotics to treat infection, and other drugs to reduce swelling or itching.



## Throat Changes

What they are

Radiation therapy to the neck or chest can cause the lining of your throat to become inflamed and sore. This is called esophagitis. You may feel as if you have a lump in your throat or burning in your chest or throat. You may also have trouble swallowing.

Why they occur

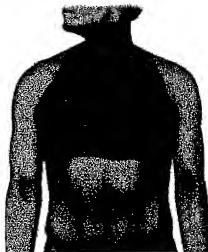
Radiation therapy to the neck or chest can cause throat changes because it not only kills cancer cells, but can also damage the healthy cells that line your throat. Your risk for throat changes depends on how much radiation you are getting, whether you are also having chemotherapy, and whether you use tobacco and alcohol while you are getting radiation therapy.

How long they last

You may notice throat changes 2 to 3 weeks after starting radiation. You will most likely feel better 4 to 6 weeks after radiation therapy has finished.

Ways to manage

- **Be careful what you eat when your throat is sore.**
  - Choose foods that are easy to swallow.
  - Cut, blend, or shred foods to make them easier to eat.
  - Eat moist, soft foods such as cooked cereals, mashed potatoes, and scrambled eggs.
  - Wet and soften food with gravy, sauce, broth, yogurt, or other liquids.
  - Drink cool drinks.
  - Sip drinks through a straw.
  - Eat foods that are cool or at room temperature.



Radiation to the shaded area may cause throat changes.

- Eat small meals and snacks. It may be easier to eat a small amount of food at one time. Instead of eating 3 large meals each day, you may want to eat 5 or 6 small meals and snacks.
- Choose foods and drinks that are high in calories and protein. When it hurts to swallow, you may eat less and lose weight. It is important to keep your weight the same during radiation therapy. Having foods and drinks that are high in calories and protein can help you. See the [chart of foods and drinks that are high in calories and protein](#) for ideas.
- Sit upright and bend your head slightly forward when you are eating or drinking. Remain sitting or standing upright for at least 30 minutes after eating.
- Don't have things that can burn or scrape your throat, such as:
  - Hot foods and drinks
  - Spicy foods
  - Foods and juices that are high in acid, such as tomatoes and oranges
  - Sharp, crunchy foods such as potato or corn chips
  - All tobacco products, such as cigarettes, pipes, cigars, and chewing tobacco
  - Drinks that contain alcohol
- Talk with a dietitian. He or she can help make sure you eat enough to maintain your weight. This may include choosing foods that are high in calories and protein and foods that are easy to swallow.
- Talk with your doctor or nurse. Let your doctor or nurse know if you notice throat changes, such as trouble swallowing, feeling as if you are choking, or coughing while eating or drinking. Also, let him or her know if you have pain or lose any weight. Your doctor can prescribe medicines that may help relieve your symptoms, such as antacids, gels that coat your throat, and pain killers.

Let your doctor or nurse know if you:

- Have trouble swallowing
- Feel as if you are choking
- Cough while you are eating or drinking

## Urinary and Bladder Changes

What they are

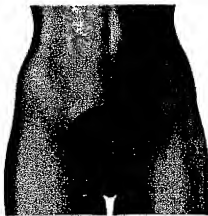
Radiation therapy can cause urinary and bladder problems, which can include:

- Burning or pain when you begin to urinate or after you empty your bladder
- Trouble starting to urinate
- Trouble emptying your bladder
- Frequent, urgent need to urinate
- Cystitis, a swelling (inflammation) in your urinary tract
- Incontinence, when you cannot control the flow of urine from your bladder, especially when coughing or sneezing
- Frequent need to get up during sleep to urinate
- Blood in your urine
- Bladder spasms, which are like painful muscle cramps

Why they occur

Urinary and bladder problems may occur when people get radiation therapy to the prostate or bladder. Radiation therapy can harm the healthy cells of the bladder wall and urinary tract, which can cause inflammation, ulcers, and infection.

How long they last

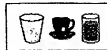


Radiation to the shaded area may cause urinary and bladder changes.

Urinary and bladder problems often start 3 to 5 weeks after radiation therapy begins. Most problems go away 2 to 8 weeks after treatment is over.

#### Ways to manage

- **Drink a lot of fluids.** This means 6 to 8 cups of fluids each day. Drink enough fluids so that your urine is clear to light yellow in color.
- **Avoid coffee, black tea, alcohol, spices, and all tobacco products.**
- **Talk with your doctor or nurse if you think you have urinary or bladder problems.** He or she may ask for a urine sample to make sure that you do not have an infection.
- **Talk to your doctor or nurse if you have incontinence.** He or she may refer you to a physical therapist who will assess your problem. The therapist can give you exercises to improve bladder control.
- **Medicine.** Your doctor may prescribe antibiotics if your problems are caused by an infection. Other medicines can help you urinate, reduce burning or pain, and ease bladder spasms.



Drink 6 to 8 cups of fluids each day.

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## Breast Cancer

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- Breast cancer overview
  - What are my treatment options?
  - What happens during radiation therapy?
  - What are possible side effects of radiation therapy?
  - What are some of the possible risks or complications?
  - What kind of treatment follow-up should I expect?
  - Are there any new developments in treating my disease?
- 

### Breast cancer overview

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It is estimated that more than 210,000 women in the U.S. will be diagnosed with breast cancer in 2003. It is now possible to detect most breast cancers at a very early state. With early detection and improved treatments more women are surviving breast cancer. Today, women have more treatment options than ever before.

*See the Mammography page for more information about early detection.*

### What are my treatment options?

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- Treatment options overview
- How can I make a decision between mastectomy and breast conservation therapy?
- Is radiation therapy necessary if the margins of the removed tissue are negative?
- What are the cosmetic results of breast conservation therapy?
- What is the prognosis after recurrence?

### Treatment options overview

Treatment options include mastectomy or breast conservation therapy (BCT). Mastectomy is an operation to remove the entire breast, including the nipple and glands under the arms called axillary nodes. Mastectomy usually requires a hospital stay. Women who undergo a mastectomy have the option of breast reconstruction.

Breast conservation surgery removes the breast tumor and a margin of surrounding normal tissues. It is also known by other names: lumpectomy, partial mastectomy, segmental mastectomy and quadrantectomy. Radiation therapy follows lumpectomy to eliminate any microscopic cancer cells in the remaining breast tissue. The purpose of breast conservation therapy is to give women the same cure rate they would have if they were treated with a mastectomy-but to leave the breast intact, with an appearance and texture as close as

possible to what they had before treatment. The surgeon may remove the lymph nodes at the same time as the lumpectomy procedure or later. It is estimated that 75 percent to 80 percent of patients can be treated with breast conservation therapy rather than mastectomy with excellent results. Years of clinical study have proven that breast conservation therapy offers the same cure rate as mastectomy.

Your radiation therapy procedure might include:

**External Beam Therapy** - see *External Beam Therapy page*

**Intensity-Modulated Radiation Therapy** - see *Intensity-Modulated Radiation Therapy page*

**Interstitial Therapy** (or "Brachytherapy") - the temporary placement of radioactive materials within the breast, usually employed to give an extra dose of radiation to the area of the excision site (called a "boost"). - see *Brachytherapy page*

Patients may also have chemotherapy or hormonal therapy if there is a risk that the cancer may have spread outside of the breast to other body organs.

### **How can I make a decision between mastectomy and breast conservation therapy?**

Breast conservation therapy is used for patients with early-stage invasive breast cancers (called Stage I and Stage II in the classification system). It is also used for patients with ductal carcinoma in situ (DCIS, called Stage 0). Some of the reasons to not have breast conservation therapy include: personal preference; increased risk of complications from radiation therapy in individuals with certain rare medical conditions; and tumors that are more likely than average to have a relapse in a breast with breast conservation therapy.

Most patients can choose a treatment based on other factors, such as convenience (for example, how far you must travel to receive radiation therapy) or personal preference (feeling safer if you undergo a mastectomy or being very worried about the possible side effects from radiation therapy). Most women prefer to keep their breast if this is possible to do safely, but there is no right answer for everyone. However, this decision is not one the physician can make for you.

Nearly all physicians will recommend patients be treated with mastectomy instead of breast conservation therapy when the risk of recurrence in the breast is more than 20 percent. This is the case for only a small number of women, however.

### **Is radiation therapy necessary if the margins of the removed tissue are negative?**

Many studies have reviewed this approach for patients with invasive cancers. Nearly all show that the risk of relapse in the breast is much higher when radiation is not used (20 percent to 40 percent) than when it is (5 percent to 10 percent). Having breast cancer reappear in

this way is a very traumatic event psychologically. Also, patients may need to have a mastectomy to be cured in this situation, so in more cases they may lose the breast than if they had undergone radiation therapy initially. Finally, not everyone who has a recurrence in the breast can be cured. Therefore, radiation therapy after lumpectomy is the standard treatment around the world.

There are several recent studies in which older patients with small, favorable invasive cancers have had a low risk of local relapse when treated with lumpectomy and hormonal therapy without radiation therapy. There is still uncertainty about the long-term results with this approach or about which individuals will do best without radiation therapy. This issue should be discussed in detail with your doctor.

For patients with noninvasive cancer (known as "ductal carcinoma in situ") matters are more complicated. Lumpectomy without radiation works well for many patients. However, there is disagreement on who can be treated safely with just a lumpectomy. This should be discussed in detail with your doctor.

### **What are the cosmetic results of breast conservation therapy?**

Eighty percent to 90 percent of women treated with modern surgery and radiotherapy techniques have excellent or good cosmetic results; that is, little or no change in the treated breast in size, shape, texture or appearance compared with what it was like before treatment.

Patients with large breasts seem to have greater shrinkage of the breast after radiation therapy than do smaller-breasted patients. However, this problem usually can be overcome with the use of higher x-ray energies.

### **What is the prognosis after recurrence?**

Many patients with a recurrence of breast cancer can be successfully treated, often with methods other than radiation if radiation was used in the initial treatment. For patients treated initially for invasive breast cancer, 5 percent to 10 percent will be found to have distant metastases at the time of discovery of the breast recurrence. The same proportion will have recurrences that are too extensive to be operated on. These patients are rarely, if ever, cured. Five-year cure rates for patients with relapse after breast conservation therapy are approximately 60 percent to 75 percent if the relapse is confined to the breast and a mastectomy is then performed.

For patients treated initially for ductal carcinoma in situ (DCIS), about one-half of recurrences are invasive and one-half noninvasive DCIS. Cure rates following recurrence after initial breast conservation therapy have been high (90 percent to 100 percent) in some studies but are not always perfect.

### **What happens during radiation therapy?**

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Radiation is a special kind of energy carried by waves or a stream of

particles. When radiation is used at high doses (many times those used for x-ray imaging exams) it can destroy abnormal cells that cause cancer and other illnesses.

## **What are possible side effects of radiation therapy?**

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There are no immediate side effects from each radiation treatment given to the breast. Patients do not develop nausea or hair loss on the head.

Most patients develop mild fatigue that builds up gradually over the course of therapy. This slowly goes away one to two months following the radiation therapy. Most patients develop dull aches or sharp shooting pains in the breast that may last for a few seconds or minutes. It is rare for patients to need any medication for this. The most common side effect needing attention is skin reaction. Most patients develop reddening, dryness and itching of the skin after a few weeks. Some patients develop substantial irritation.

Skin care recommendations include:

- Keeping the skin clean and dry using warm water and gentle soap
- Avoiding extreme temperatures while bathing
- Avoiding trauma to the skin and sun exposure (use a sunscreen with at least SPF 15)
- Avoiding shaving the treatment area with a razor blade (use an electric razor if necessary)
- Avoiding use of perfumes, cosmetics, after-shave or deodorants in the treatment area (use cornstarch with or without baking soda in place of deodorants)
- Using only recommended unscented creams or lotions after daily treatment.

Some patients develop a sunburn-like reaction with blistering and peeling of the skin, called "moist desquamation." This usually occurs in the fold under the breast or in the fold between the breast and the arm, or sometimes in the area given a radiation boost. Most people with a limited area of moist desquamation can continue treatment without interruption. When treatment must be interrupted, the skin usually heals enough to allow radiation to be resumed in five to seven days. Skin reactions usually heal completely within a few weeks of completing radiotherapy.

## **What are some of the possible risks or complications?**

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Minor complications include:

- Slight swelling of the breast during radiotherapy. This usually goes away within six to 12 months.
- The skin becomes darker during the course of radiotherapy, similar to tanning from the sun. In most cases, this also fades gradually over six to 12 months.
- Most women will have aches or pains from time to time in the treated breast or the muscles surrounding the breast, even years after treatment. The reason why this happens is not clear; however, these pains are harmless, although annoying. They are NOT a sign that the cancer is reappearing.
- Rarely, patients may develop a rib fracture years following treatment. This occurs in less than 1 percent of patients treated by modern approaches. These heal slowly by themselves.

More serious complications include:

- Very rarely, patients develop a breakdown of the skin, fractures of the sternum (breastbone) or such severe pain in the breast that surgery is needed for treatment.
- Radiation therapy given to the axillary lymph nodes can increase the risk of patients developing arm swelling ("lymphedema") following axillary (armpit) dissection. Radiation to this area can cause numbness, tingling or even pain and loss of strength in the hand and arm years after treatment. Fortunately, both these treatment effects are very rare.
- Some patients develop "radiation pneumonitis," a lung reaction that causes a cough, shortness of breath and fevers three to nine months after completing treatment. Fortunately, it is usually mild enough that no specific treatment is needed and it goes away within two to four weeks with no long-term complications.
- Radiotherapy may damage the heart. Fortunately, radiation techniques used now treat much less of the heart than those used in the past. Current studies have found no increased risk of serious heart disease in patients treated with modern techniques even 10 to 20 years after radiotherapy treatment was given. However, there is still some uncertainty about the risks of radiation causing heart disease for individuals who smoke or have pre-existing heart disease, or for those who receive certain chemotherapy drugs. It is likely that such risks will also be found to be very small.
- Women age 45 or younger at the time of treatment may have a slightly increased risk (by a few percent at most) of developing cancer of the other breast with time, compared with the risk they would have if they did not undergo radiation. There is a very small risk (perhaps one in 1,000 individuals) that cancers may develop five, 10, 20 or more years later in the skin, muscle, bone or lung directly in the area of treatment.

## **What kind of treatment follow-up should I expect?**

The major goal of follow-up is, if possible, to detect and treat recurrences in the irradiated breast or lymph nodes and new cancers developing later in either breast before they can spread to other parts of the body. The routine use of bone scans, chest x-rays, blood tests and other tests to detect the possible spread to other organs in patients without symptoms does not appear to be useful. Your physician will determine a follow-up schedule for you. This may include a physical exam every few months for the first several years after treatment and then every six to 12 months or so after that. Annual follow-up mammograms are an important part of your care. If symptoms or clinical circumstances suggest a recurrence, diagnostic tests such as blood tests, ultrasound, computed tomography (CT), magnetic resonance imaging (MRI), chest x-ray (CXR), or bone scan may be needed.

## Are there any new developments in treating my disease?

### Clinical Trials

To learn about current clinical trials being conducted, see the Clinical Trials page of the National Cancer Institute's Web site.

#### Additional Breast Cancer Information and Resources:

RadiologyInfo: Mammography  
RTAnswers.com: Radiation Therapy for Breast Cancer  
National Cancer Institute: Breast Cancer  
American Cancer Society: All About Breast Cancer  
The White House: National Breast Cancer Awareness Month

To locate a medical imaging or radiation oncology provider in your community, you can search the ACR-accredited facilities database.

**Note About Links:** For the convenience of our users, *RadiologyInfo* provides links to relevant Web sites. *RadiologyInfo*, ACR and RSNA are not responsible for the content contained on the Web pages found at these links.

This procedure is reviewed by a physician with expertise in the area presented and is further reviewed by committees from the American College of Radiology (ACR) and the Radiological Society of North America (RSNA), comprising physicians with expertise in several radiologic areas.

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## Radiation Therapy and You: Support for People With Cancer



Posted: 04/20/2007

In English | En español

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### Questions about cancer?

- 1-800-4-CANCER

## Questions and Answers About Radiation Therapy

**What is radiation therapy?**

**Radiation therapy** (also called **radiotherapy**) is a cancer treatment that uses high doses of radiation to kill cancer cells and stop them from spreading. At low doses, radiation is used as an x-ray to see inside your body and take pictures, such as x-rays of your teeth or broken bones. Radiation used in cancer treatment works in much the same way, except that it is given at higher doses.

**How is radiation therapy given?**

Radiation therapy can be **external beam** (when a machine outside your body aims radiation at cancer cells) or **internal** (when radiation is put inside your body, in or near the cancer cells). Sometimes people get both forms of radiation therapy. To learn more about external beam radiation therapy, see "[External Beam Radiation Therapy](#)". To learn more about internal radiation therapy, see "[Internal Beam Radiation Therapy](#)".

**Who gets radiation therapy?**

Many people with cancer need radiation therapy. In fact, more than half (about 60 percent) of people with cancer get radiation therapy. Sometimes, radiation therapy is the only kind of cancer treatment people need.

**What does radiation therapy do to cancer cells?**

Given in high doses, radiation kills or slows the growth of cancer cells. Radiation therapy is used to:

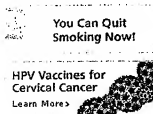
- Treat cancer. Radiation can be used to cure, stop, or slow the growth of cancer.
- Reduce symptoms. When a cure is not possible, radiation may be used to shrink cancer tumors in order to reduce pressure. Radiation therapy used in this way can treat problems such as pain, or it can prevent problems such as blindness or loss of bowel and bladder control.

**How long does radiation therapy take to work?**

Radiation therapy does not kill cancer cells right away. It takes days or weeks of treatment before cancer cells start to die. Then, cancer cells keep dying for weeks or months after radiation therapy ends.

## NCI Highlights

[Report Finds Cancer Death Rate Decline Doubling](#)  
[The Nation's Investment in Cancer Research FY 2008](#)  
[Statement on Fiscal Year 2008 Budget Request](#)  
[President's Cancer Panel Annual Report: 2006-2007](#)  
[Cancer Trends Progress Report: 2005 Update](#)  
[NCAB Working Group Report on Biomedical Technology](#)  
[Past Highlights](#)



What does radiation therapy do to healthy cells?

Radiation not only kills or slows the growth of cancer cells, it can also affect nearby healthy cells. The healthy cells almost always recover after treatment is over. But sometimes people may have side effects that do not get better or are severe. Doctors try to protect healthy cells during treatment by:

- **Using as low a dose of radiation as possible.** The radiation dose is balanced between being high enough to kill cancer cells yet low enough to limit damage to healthy cells.
- **Spreading out treatment over time.** You may get radiation therapy once a day for several weeks or in smaller doses twice a day. Spreading out the radiation dose allows normal cells to recover while cancer cells die.
- **Aiming radiation at a precise part of your body.** New techniques, such as **IMRT** and **3-D conformal radiation therapy**, allow your doctor to aim higher doses of radiation at your cancer while reducing the radiation to nearby healthy tissue.
- **Using medicines.** Some drugs can help protect certain parts of your body, such as the salivary glands that make saliva (spit).

Does radiation therapy hurt?

No, radiation therapy does not hurt while it is being given. But the side effects that people may get from radiation therapy can cause pain or discomfort. This book has a lot of information about ways that you, your doctor, and your nurse can help manage side effects.

Is radiation therapy used with other types of cancer treatment?

Yes, radiation therapy is often used with other cancer treatments. Here are some examples:

- **Radiation therapy and surgery.** Radiation may be given before, during, or after surgery. Doctors may use radiation to shrink the size of the cancer before surgery, or they may use radiation after surgery to kill any cancer cells that remain. Sometimes, radiation therapy is given during surgery so that it goes straight to the cancer without passing through the skin. This is called **intraoperative radiation**.
- **Radiation therapy and chemotherapy.** Radiation may be given before, during, or after chemotherapy. Before or during chemotherapy, radiation therapy can shrink the cancer so that chemotherapy works better. Sometimes, chemotherapy is given to help radiation therapy work better. After chemotherapy, radiation therapy can be used to kill any cancer cells that remain.

Who is on my radiation therapy team?



Many people help with your radiation treatment and care. This group of health care providers is often called the "radiation therapy team." They work together to provide care that is just right for you. Your radiation therapy team can include:

- **Radiation oncologist.** This is a doctor who specializes in using radiation therapy to treat cancer. He or she prescribes how much radiation you will receive, plans how your treatment will be given, closely follows you during your course of treatment, and prescribes care you may need to help with side effects. He or she works closely with the other doctors, nurses, and health care providers on your

team. After you are finished with radiation therapy, your radiation oncologist will see you for follow-up visits. During these visits, this doctor will check for late side effects and assess how well the radiation has worked.

- **Nurse practitioner.** This is a nurse with advanced training. He or she can take your medical history, do physical exams, order tests, manage side effects, and closely watch your response to treatment. After you are finished with radiation therapy, your nurse practitioner may see you for follow-up visits to check for late side effects and assess how well the radiation has worked.
- **Radiation nurse.** This person provides nursing care during radiation therapy, working with all the members of your radiation therapy team. He or she will talk with you about your radiation treatment and help you manage side effects.
- **Radiation therapist.** This person works with you during each radiation therapy session. He or she positions you for treatment and runs the machines to make sure you get the dose of radiation prescribed by your radiation oncologist.
- **Other health care providers.** Your team may also include a dietitian, physical therapist, social worker, and others.
- **You.** You are also part of the radiation therapy team. Your role is to:
  - Arrive on time for all radiation therapy sessions
  - Ask questions and talk about your concerns
  - Let someone on your radiation therapy team know when you have side effects
  - Tell your doctor or nurse if you are in pain
  - Follow the advice of your doctors and nurses about how to care for yourself at home, such as:
    - Taking care of your skin
    - Drinking liquids
    - Eating foods that they suggest
    - Keeping your weight the same

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**You are the most important part of the radiation therapy team.**

**Be sure to arrive on time for ALL radiation therapy sessions.**

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Is radiation  
therapy  
expensive?

Yes, radiation therapy costs a lot of money. It uses complex machines and involves the services of many health care providers. The exact cost of your radiation therapy depends on the cost of health care where you live, what kind of radiation therapy you get, and how many treatments you need.

Talk with your health insurance company about what services it will pay for. Most insurance plans pay for radiation therapy for their members. To learn more, talk with the business office where you get treatment. You can also contact the National Cancer Institute's Cancer Information Service and ask for the "Financial Assistance for Cancer Care" fact sheet. See "Resources for Learning More" for ways to contact the National Cancer Institute.

Should I follow a special diet while I am getting radiation therapy?

Your body uses a lot of energy to heal during radiation therapy. It is important that you eat enough calories and protein to keep your weight the same during this time. Ask your doctor or nurse if you need a special diet while you are getting radiation therapy. You might also find it helpful to speak with a dietitian.

To learn more about foods and drinks that are high in calories or protein, see "[Foods and Drinks That Are High in Calories or Protein](#)". You may also want to read [Eating Hints](#), a book from the National Cancer Institute. You can order a free copy online at [www.cancer.gov/publications](http://www.cancer.gov/publications) or 1-800-4-CANCER.

Ask your doctor, nurse, or dietitian if you need a special diet while you are getting radiation therapy.

Can I go to work during radiation therapy?

Some people are able to work full-time during radiation therapy. Others can only work part-time or not at all. How much you are able to work depends on how you feel. Ask your doctor or nurse what you may expect based on the treatment you are getting.

You are likely to feel well enough to work when you start radiation therapy. As time goes on, do not be surprised if you are more tired, have less energy, or feel weak. Once you have finished your treatment, it may take a few weeks or many months for you to feel better.

You may get to a point during your radiation therapy when you feel too sick to work. Talk with your employer to find out if you can go on [medical leave](#). Make sure that your health insurance will pay for treatment when you are on medical leave.

What happens when radiation therapy is over?

Once you have finished radiation therapy, you will need [follow-up care](#) for the rest of your life. Follow-up care refers to checkups with your radiation oncologist or nurse practitioner after your course of radiation therapy is over. During these checkups, your doctor or nurse will see how well the radiation therapy worked, check for other signs of cancer, look for late side effects, and talk with you about your treatment and care. Your doctor or nurse will:

- Examine you and review how you have been feeling. Your doctor or nurse practitioner can prescribe medicine or suggest other ways to treat any side effects you may have.
- Order lab and imaging tests. These may include blood tests, x-rays, or CT, MRI, or PET scans.
- Discuss treatment. Your doctor or nurse practitioner may suggest that you have more treatment, such as extra radiation treatments, chemotherapy, or

both.

- Answer your questions and respond to your concerns. It may be helpful to write down your questions ahead of time and bring them with you. You can find sample questions in ["Questions To Ask Your Doctor or Nurse"](#).

After radiation therapy is over, what symptoms should I look for?

You have gone through a lot with cancer and radiation therapy. Now you may be even more aware of your body and how you feel each day. Pay attention to changes in your body and let your doctor or nurse know if you have:

- A pain that does not go away
- New lumps, bumps, swellings, rashes, bruises, or bleeding
- Appetite changes, [nausea](#), [vomiting](#), diarrhea, or constipation
- Weight loss that you cannot explain
- A fever, cough, or hoarseness that does not go away
- Any other symptoms that worry you

See ["Resources for Learning More"](#) for ways to learn more about radiation therapy.



Make a list of questions and problems you want to discuss with your doctor or nurse. Be sure to bring this list to your follow-up visits. See ["Questions To Ask Your Doctor or Nurse"](#) for sample questions.

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